

The Effect Of Multi Micronutrients And Moorgan Capsules On Body Weight And Hemoglobin Levels Of Pregnant Women In Banggai District, Central Sulawesi

¹Muhammad Lulu Rigalu Tenrisila, ²Veni Hadju, ³Abdul Salam, ⁴Healthy Hidayanti, ⁵Mushawwir Taiyeb, ⁶Masyitha Muis

¹Postgraduate Student Department of Nutrition, Faculty of Public Health, Hasanuddin University, Makassar, South Sulawesi, Indonesia, lulurigalutenrisila@gmail.com

^{2,3,4}Department of Nutrition, Faculty of Public Health, Hasanuddin University, Makassar, South Sulawesi, Indonesia

⁵Department of Biology, Faculty of Mathematics and Science, Makassar State University, Makassar, South Sulawesi, Indonesia

⁶Department of Occupational Health and Safety, Faculty of Public Health, Hasanuddin University, Makassar, South Sulawesi, Indonesia

Abstract

The prevalence of anemia in pregnant women is still quite high. Anemia is one of the determinants of Maternal Mortality Rate. This study was conducted to assess the effect of multi-micronutrients and Moringa capsules on weight gain and the incidence of anemia in pregnant women. The research design was quasi-experimental, the study was conducted for two months, there were two groups, the intervention group was 37 people and the control group was 35 people. In the intervention group, the intervention was given with multi-micronutrients and Moringa capsules. For the control group, the intervention was given only with multi-micronutrients. The variables measured were body weight using an anthropometric tool and the hemoglobin level variable using the GCHb tool for blood sampling. Data analysis used the Wilcoxon Signed Rank Test and the Mann Whitney Test. Results of the study is After being given an intervention for 60 days, the average increase in Hb levels in the two groups was different. The administration of multi-micronutrient vitamins and Moringa capsules on hemoglobin levels for the intervention group increased from 12.37 g/dL to 12.89 g/dL, for the control group, which was only given multi-micronutrients, decreased from 12.02 g/dL to 11.94 g/dL. In the weight variable, each group experienced an increase for the intervention group from 56.73 Kg to 61.45 Kg and the control group from 56.44 Kg to 60.96 Kg. There was a significant difference in the increase in Hb levels in the intervention group of pregnant women who consumed multi micronutrients and Moringa capsules, but the results of the different test of hemoglobin levels and body weight variables were not significant between the two intervention and control groups.

Keywords: Multi Micronutrients, Moringa Capsules, Hemoglobin, Body Weight, Pregnant Women.

Introduction

According to WHO, women aged 15-49 years who suffer from anemia in six countries, namely Africa, America, Asia, Europe, Eastern Mediterranean, West Pacific Region amounted to 409-595 million people. Anemia is a

nutritional problem that is found throughout the world which does not only occur in developing countries but also in developed countries. The World Health Organization (WHO) states that anemia is the 10 biggest health problems in this modern century. In Asia, the prevalence of

anemia at the age of 15-45 years reaches 191 million people and Indonesia ranks 8th out of 11 countries in Asia after Sri Lanka with a prevalence of anemia of 7.5 million people aged 10-19 years [1].

Based on World Health Organization data [1] reported that the prevalence of pregnant women with iron deficiency ranged from 35-75%, while based on the results of the Basic Health Research (Riskesdas 2018) the prevalence of anemia in pregnant women increased in 2013 from 37.1% to 48.9% in 2018, while the prevalence of anemia in pregnant women increased from 37.1% to 48.9% in 2018. pregnant women who took blood-added tablets < 90 tablets were 61.9% [2]. In the health sector, the data from Riskesdas at the Central Sulawesi Province level shows that the incidence of anemia in pregnant women in 2014 in Central Sulawesi Province was 4,165 cases of pregnant women with Hb anemia (<8-11 mg/dl), while pregnant women with anemia with Hb (<8 mg/dl) in 459 cases. And in 2015 there were 2,621 cases of anemic pregnant women with Hb (<8-11 mg/dl), while 217 cases of anemic pregnant women with Hb (<8 mg/dl). In 2016 from January to November the number of cases of pregnant women with Hb anemia (<8-11 mg/dl) was 6,665 cases. Pregnant women with anemia with Hb (<8 mg/dl) were 1,279 cases. The Department of Health said cases of pregnant women with anemia were 838 cases (23.42%) in 2014, cases of pregnant women with anemia were 888 cases (24.43%) in 2015. Whereas in 2016 from January to October there were cases of anemia in pregnant women as many as 1,231 cases (36.69%) (Data on Total MMR and anemia in pregnant women [3].

One supplement that contains vitamins that can increase absorption is Multi Micronutrients (MMN), multi micronutrients not only contain iron but also contain 15 types of vitamins and minerals that are important for pregnant women including vitamin A, vitamin B1, vitamin B2, vitamin B3, vitamin B6, vitamin B12, vitamin C, vitamin D, vitamin E, folic acid, Fe, zinc, copper, selenium, and iodine [4]. From the research conducted, the intervention of giving multi micronutrients to pregnant women for 91 days can increase hemoglobin by about (0.53 g/dL). In line with research conducted by [5] where the composition of multi micronutrient

tablets (MMN) is more complete in micronutrient content than Fe-folic acid tablets. Contains B vitamins that can increase appetite and increase weight in pregnant women.

According to results [6], Moringa leaves contain high Fe and can be used as a natural alternative to overcome anemia in pregnant women. Moringa leaves also contain elements of micronutrients that are needed by pregnant women. Such as beta (B2), calcium, iron, phosphorus, magnesium, vitamin C, as an alternative to improve the nutritional status of pregnant women. With maternal nutrition greatly affects the weight of the mother and the weight of the newborn, because the quality of the baby born is very dependent on the nutritional state of the mother. [7] association between consumption of Moringa leaves with weight gain and the results prove that Moringa leaves can prevent weight loss in pregnant women because of the excess protein content of the Moringa plant [7].

Methods

This research was conducted in Batui Selatan District, Banggai Regency, where three intervention locus villages have been determined by the Banggai Regency Government in 2021. The three villages are Sinorang Village, Respective Village, and Sukamaju Village 1. The control village is Gori-gori Village, Bone Balantak, Sukamaju.

The type of research used was experimental with a quasi-experimental design to explain the effect of giving multi micronutrients and Moringa capsules to pregnant women on weight gain and the incidence of anemia in Banggai Regency, Central Sulawesi. There are 2 groups, namely the intervention group as many as 37 people and the control group as many as 35 people. The intervention group received multi-micronutrients and Moringa capsules, while the control group only received multi-micronutrients. The intervention was carried out for 60 days with a dose given 1 day 1 tablet and controlled for each group by creating a whatsapp group for each intervention village for every day the researcher reminded pregnant women to take their vitamins and was also assisted with book facilities in which there was a paper format if already taking vitamins,

pregnant women must check the format column, besides that researchers also control through meetings with pregnant women in each village once a week by discussing the process of taking vitamins.

Data collection for this study used a questionnaire interview for primary data collection which included data on respondent characteristics, measurement of body weight using anthropometric tools, measuring upper arm circumference using a midline (measuring tape), consumption patterns based on 24-hour food recall, and hemoglobin levels using a measuring tape. GCHb. Meanwhile, secondary data is taken indirectly from the respondent's MCH book, such as weight data. Data analysis used non-parametric test, for characteristics using chi square test, for pre-post the Wilcoxon test was used and for both groups the Mann Whitney test was used. The data were analyzed using statistical software, namely the Statistical Package for Social Sciences (SPSS).

Results and Discussion

The results of the study based on the family baseline can be seen in Table 1, generally the education level of the mother graduated from SMA/MA/equivalent is 47.3%, most of the

mothers do not work 70.7%, Islam is 85.6%, family income is 1 - 2 million / month 41.7%, and the frequency of the number of meals a day increased by 68%.

The results of the analysis showed that all variables had no significant or homogeneous differences ($p > 0.05$). The baseline data for the two groups were relatively the same, meaning that the initial conditions before the intervention could not be said to be different.

The results of the different test variables for hemoglobin, body weight, and upper arm circumference in Table 2 show that the intervention group before and after the intervention had an average hemoglobin value \pm standard deviation (12.37 g/dL \square 1.20 VS 12.89 g/dL \square 1.32) with a value of $p = 0.009$, in the control group (12.02 g/dL \square 1.44 VS 11.94 g/dL \square 1.57) with p value = 0.801. Weight intervention group (56.73 Kg \square 10.93 VS 61.45 Kg \square 11.41) with p value = 0.001, control group (56.44 Kg \square 7.36 VS 60.96 Kg \square 6.87) with p value = 0.001. LILA intervention group (25.73 Cm \square 3.49 VS 26.80 Cm \square 4.19), control group (25.90 Cm \square 2.49 VS 26.99Cm \square 2.63) with p value = 0.001. The results of the analysis showed that there was no significant change before and after the intervention in both groups ($p > 0.05$)

Table 1. Frequency Distribution of Family Characteristics in Intervention Groups and Control Groups 2021

Variable	Intervention		Control		P Value*
	n	%	n	%	
Maternal Education					0.424
Not Finished Elementary School/MI	0	0	1	2.9	
Graduated from elementary school/MI	3	8.1	5	14.3	
Graduated from Junior High School/Mts/Equivalent	11	29.7	7	20.0	
Graduated from High School/MA/Equivalent	16	43.2	18	51.4	
Diploma Finish	3	8.1	1	2.9	
Graduated from University	4	10.8	3	8.6	
Religion					0.830
Islam	31	83.8	31	87.5	
Christian	4	10.8	1	3.1	
Hindu	2	5.4	3	9.4	
Family Income					0.097
Under 1 Million	10	27.0	14	40.0	
1-2 Million	15	40.5	15	42.9	
2.1-3 Million	1	2.7	2	5.7	
3.1-5 Million	6	16.2	1	2.9	
Above 5 million	5	13.5	3	8.6	

Working Moms					0.360
Yes	9	24.3	12	34.3	
Not	28	75.7	23	65.7	
Feeding Frequency					0.633
Reduced	11	29.7	12	34.2	
Add	26	70.2	23	65.7	

Source: Primary Data, processed in 2022

(Characteristics of intervention and control groups) *Chi-Square

Table 2. Test Results Differ Variables Difference Hemoglobin Difference, Weight, Upper Arm Circumference

Variable	Pre Mean SD±	Post Mean SD±	P value	Differences Mean±SD	P value
Hb (g/dL)					
Intervention	12.37 ± PM 1.20 PM	12.89 ± 1.32 pm	0.009	0.51±1.14	0.103
Control	12.02 ± 1.44 PM	11.94 ± 1.57 pm	0.801	-0.08±1.85	
BB (Kg)					
Intervention	56.73 ± 10.93	61.45 ± 11.41	0.001	4.72±2.08	0.677
Control	56.44 ± 7.36	60.96 ± 6.87	0.001	4.52±2.05 pm	
LILA (cm)					
Intervention	25.73 ± 3.49	26.80 ± 4.19	0.001	1.07±1.67	0.941
Control	25.90 ± 2.49	26.99 ± 2.63	0.001	1.09±0.90	

Source: Primary Data,2022

(Pre anthropometry, post anthropometry, difference)

a Paired Sample T Test

b Independent Sample Test

Based on the results of the analysis, there was a change in the hemoglobin level of pregnant women before and after the intervention in the intervention group with a p value = 0.009 while in the control group who only received multi micronutrients there was no change in hemoglobin levels with a p value = 0.801. p value = 0.103.

The results of this study are in line with what has been done by [8] that the results of univariate analysis showed that the average hemoglobin level of pregnant women in the intervention group before being given Moringa leaf capsules + Fe was 9.907 g/dL while in the control group it was 9.800 g/dL. The average hemoglobin level after being given Moringa leaf capsules + Fe in the intervention group was 11.327 g/dL while in the control group it was 10.700 g/dL.

In the control group of pregnant women who only consumed Multi Micronutrient vitamins, there was no change in hemoglobin levels, similar results have been carried out by [9] pregnant women who consume multi

micronutrient vitamins there is no significant difference in hemoglobin levels between mothers who do not consume multi micronutrient vitamins. The same is explained by [10] that Multi Micronutrients are better than iron folic acid supplements can increase Hb levels but have not been able to increase ferritin reserves of pregnant women.

The results of research conducted by [11] Moringa leaf extract can increase hemoglobin levels and has the same ability as iron folic acid supplements in preventing anemia in pregnant women. However, in contrast to the results of research conducted by [12] pregnant women with informal worker status and given Moringa leaf extract could not increase hemoglobin levels of pregnant women.

Based on the results of the analysis, there was a change in body weight (BW) of pregnant women before and after the intervention in the intervention group consuming Moringa capsules and multi micronutrient tablets with p value = 0.001, in the control group receiving only multi micronutrients there was also a

change in body weight with p value = 0.001, and based on the different test there was no significant difference with p value = 0.677.

In line with research [5] MMN tablets have a more complete micronutrient content compared to Fe-folic acid tablets, besides containing iron and folic acid, they also contain B vitamins that can increase appetite during pregnancy so that when given multi micronutrients, the nutritional status of pregnant women can be more optimal and increase weight gain. body. Findings by [13] giving Moringa leaf extract to pregnant women can significantly increase the weight of pregnant women.

However, the results of this study are different from those carried out by [7] Moringa leaf powder contains iron but its low bioavailability cannot maintain body weight and cannot meet the iron needs of women who are breastfeeding.

Based on the results of the analysis, there was a change in the upper arm circumference (LILA) of pregnant women before and after the intervention in the intervention group with a p value = 0.001 Likewise in the control group who only received multi micronutrients there was no change in LILA with a p value = 0.000, but based on the different test there was no significant difference with p value = 0.155.

Conclusion

Giving multi micronutrient vitamins and Moringa capsules to pregnant women on hemoglobin levels was very good, there was an increase in Hb in the intervention group and a significantly higher average increase of 12.89 g/dL. For weight and Lila increased in both groups and the size of the change was not significant. How to maximize effectiveness to increase Hb levels of pregnant women, local governments need to consider giving additional vitamins for pregnant women, namely Moringa capsules which are rich in iron and antioxidants.

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